

Biometric Security Bags

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ABSTRACT

Now a day's security has become the major concern for everyone. Due to these busy schedules, we didn't get enough time to look around or can say keep watch on our surrounding because of which we didn't notice the unusual activity which leads to a higher crime rate and become a major concern. The assailant has mastered themselves in hiding behind the cover of innocence and goodwill and executes their plan when they feel it's the right time which has led to crime rate 47%. The crime is seriously needed to be controlled and so is the crime rate.

Our project "Biometric Security Bags" is based on the problems we face most often in our life.

It is a basic idea to create a bag which is secured by biometric lock and code lock which will be dual authentication with a GPS and GSM system will help us to keep our belongings safe. We will also introduce a mini camera which will capture our surrounding. The bag can be used for the multipurpose security of our valuables and at the same time for security of human.

KEYWORDS: *IoT, GPS, GSM, Biometric sensors*

How to cite this paper: Deepti Rana | Ashwini Karnale | Divyashruti Mane | Mangal Kotkar "Biometric Security Bags"

Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-5 | Issue-4, June 2021, pp.1442-1447,

URL: www.ijtsrd.com/papers/ijtsrd43611.pdf



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I. INTRODUCTION

This In the recent pandemic situation, people have been facing many problems such as an increase in the rate of unemployment, drastic shoot-up in the prices of all our daily needs. These problems are giving rise to the increase in crime rate. According to the national crime record bureau, the crime rate has been observed to be 47%. It has also stated that if the crime rate goes above 50%, people will have to struggle for living a safe and secured life.

One of the factors behind the increasing crime rate is lack of evidences. Evidence plays a very crucial role for the identification and gaining the information regarding the crime. This project will not only help us for capturing such evidences but it will also provide a next level security factor where one will be able to share their location with their trusted people.

This paper showcases the implementation of a Biometric Security Bag that not only provides security to our valuable belongings but it also provides personal security and helps us to gain evidences and proofs of the crime at an affordable cost. This system will be beneficial for the police and judicial officials or the crime branch to look into the matter with much more clarity. This system will be equipped with an alert system, GPS module, GSM module, biometric sensor, motion detection sensor, proximity sensor, a mini camera and a cloud server which gives the ability to the system to provide an effective, efficient and economical way to track the bag and capture the surrounding in case of a theft or an uncertain situation.

The owner will be granted access once his fingerprint is matched. A notification will be sent by the application regarding the access granted. If in case the owner

experiences a situation of personal insecurity, the owner then has to scan a wrong finger on the biometric scanner less than three or three times. When the number of attempts of unmatched or wrong fingerprints are less than or equal to three times, a message containing the location and images of surrounding will be sent to the alternate number belonging to the trusted person that is specified by the owner. The owner will also be able to trigger the alert system and will be provided with the facility of live streaming to capture the surrounding situation which he is currently experiencing.

If the system records the number of attempts of the unmatched fingerprint more than 3 times then a notification will be sent by the application with the options 'YES' and 'No' in order to verify if it was done by the owner or not. If it was not done by the owner and the owner clicks on the option 'NO' then the bag will be tracked and a message containing its accurate location will be sent to the alternate number provided by the owner. The accurate location will be obtained by using the GPS module and GSM module.

II. Motivation

The pandemic has affected so many jobs right now that the rise in crime rate is much more of a concern, we know that the increasing crime rate has led greater impact on security and safety of humans as well as the personal valuables and belongings. So, to overcome or to deal with this consequence, to provide more security and safety whereas, by understanding as well as observing the existing system available where, Real Time Tracking system for laptops is providing security to any one valuable item that is the laptop where multiple other belongings can be at risk also stealing of data can be done from the system even if it is at one place

without being notified to the user and on the other hand the security system used in mobiles and doors cannot trace a person and cannot capture the surrounding in case there is a need to know about the unknown user trying to unlock. We encountered the idea of our project by looking into the existing security and working of these, we want to overcome all these drawbacks. So, we had idea of our project which is creating biometric security bags.

III. Literature Survey

1. A unique technique to send GPS

coordinates to alternative mobiles through Short Message Service (SMS) supported world Positioning System (GPS) technology. 2 algorithms, Kalman Filter and rate Renovation, which might be utilized in conjunction with GPS are used as a basis for location tracking.

This technique will be accustomed facilitate individuals, victimisation their mobile with or while not GPS, to seek out the placement of a friend victimisation Google maps. the primary coordinates are regenerated from a GPS aided mobile on Google map, this location is then sent through SMS to a different person. The latter will then see the precise location of the sender on his map with associate accuracy of zero. 57m (Table 1). the benefits of this technology is by using existing equipments and free services like Google maps and GPS, we will construct a really reliable location chase system. the premise of this program is GPS.

GPS could be a satellite-based navigation system created from a network of twenty four satellites placed into orbit by the United States (US) Department of Defense (DoD).

GPS was originally supposed for military applications, but within the Nineteen Eighties, the govt created the system available for civilian use. GPS will show you your exact position on the world in any climate, anywhere within the world, twenty four hours each day. There aren't any subscription fees or setup charges to use GPS [6].

The improved location chase rule that uses the Kalman filter with the speed renovation method is enforced. the speed renovation method consists of a rate computer and receiving system.

By this method, the projected rule will use accurately calculable rate within the location estimation.

2. Global positioning system is globally used for the navigation purpose. GPS is principally utilized in military purpose, farming technologies, civil, transportation for instance in vehicles and business users round the world. This paper describes a sensible model for routing and chase of vehicles in an exceedingly giant space outside environment, supported GSM i.e. world System for Mobile Communication and GPS i.e. world Positioning System. The supporting device GPS unendingly move with the vehicle and records the position of the vehicle. It can be communicate with the assistance of GSM trendy that is put in in each transmitters and receivers, when it is required by the owner.

3. An object pursuit system to trace the objects through GPS Associate in Nursing Bluetooth technology. Objects are sometimes tracked by the implementation of signal strength supported GPS, GSM, RFID and Bluetooth. We make use of worldwide Positioning System (GPS) for pursuit long vary objects and Bluetooth technology for brief vary objects. The system permits a user to look at the current position of the target object on Google Map through Associate in Nursing

mechanical man application. thus every target object can have a tag that has each GPS and Bluetooth module. The experimental results suggest that a lot of belongings lost through position or theft are often found at intervals a brief span of your time by making use of the item pursuit system.

4. As the technological progress of mobile net, smartphone supported mechanical man OS accounts for the huge majority of market share. the standard coding technology cannot resolve the quandary in smartphone information discharge, and therefore the Android-based authentication system in sight of biometric recognition emerge to supply a lot of reliable info assurance. during this paper, we tend to summarize several bioscience providing their attributes. what is more, they also review the recursive framework and performance index acting on authentication techniques. Thus, typical identity authentication systems as well as their experimental results square measure concluded and analyzed within the survey.

5. These days mobile application development involves multiple OS platforms like golem, iOS, Windows, Symbian, Java Mobile and therefore the Moblin platform and a large vary of device technologies. Developed mobile applications ought to be delivered a systematically meaty user expertise across different devices and work with success on numerous OS platforms. this could look simple on paper, however it's in fact greatly many-sided, whereas putt into observe, thanks to a spread of aspects like extremely fragmented mobile technology situation, quickly evolving standards, constraints obligatory by the mobile device itself (screen size, input strategies, show capabilities, memory etc.). MoSync may be a free And an open source code Development Kit (SDK) for mobile applications. MoSync will build application packages for many completely different mobile devices on a large vary of mobile operative systems. This paper presents the design and implementations on not solely economical however versatile and secure transportable primarily based device control system mistreatment MoSync framework AND eight bit microcontroller in an ad-hoc network environment. The devices square measure connected to the on/off relay via microcontroller ports and controlled through transportable. The communication between the transportable and therefore the device system is through Bluetooth wireless technology. this method is meant to be economical and modifying eight appliances to be controlled with minimum efforts.

6. This paper report explains the methodology to track a purloined laptop computer through the implementation of GPS, GSM, Motion detector, and Cloud Services. Unlike other existing laptop computer pursuit techniques obtainable within the market, the methodology mentioned within the paper tracks the laptop computer notwithstanding it's not connected to the net or is in turn off mode. With the implementation of IoT, the owner are able to track his or her purloined laptop computer the moment it makes a tiny low movement and may trigger associate degree alarm which will be embedded within the laptop computer. The alarm will resound perceptible up to ten meters can[which will[that may} build the felon deliberate before carrying the laptop computer with himself. in the meantime the owner also will be able to monitor the placement of his or her purloined laptop computer through the mobile application put in on his or her phone by communicating with the GPS and GSM modules embedded within the laptop computer, through the cloud.

IV. PROPOSED SYSTEM

We are going to mount the biometric sensor with a lock which will be placed near zip of bags. Whenever anyone want to have access to the zip/ bag you need to scan your finger prints, if prints matched then only it will allow you to open the bag else a notification will be sent to you on your mobile about the access denied with a live location. We will also install an alarm which will ring after multiple false try to access the bags and will send your location to another given contact number. So, the basic purpose of alarm is human security which can be used during any kind of attack.

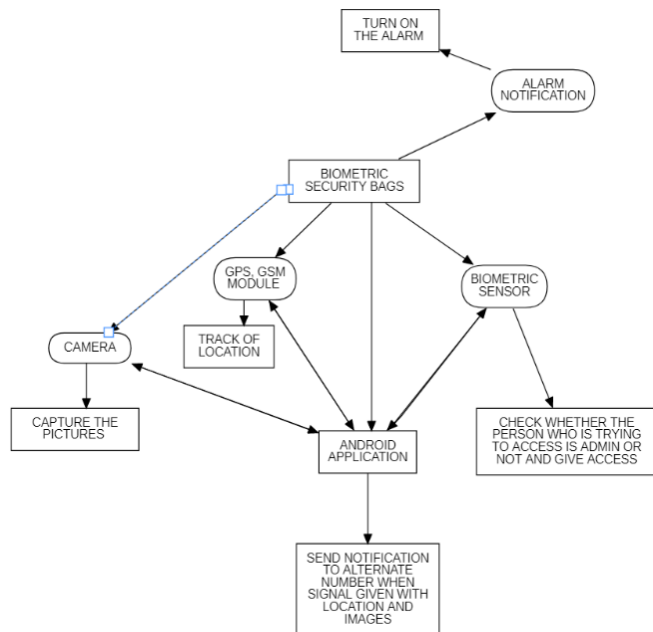


Fig 1 Architecture of proposed system

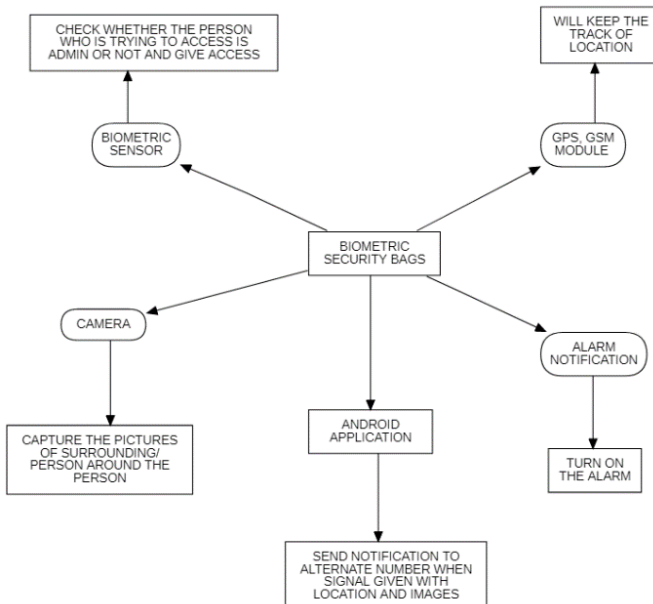


Fig.2 Block diagram of proposed system

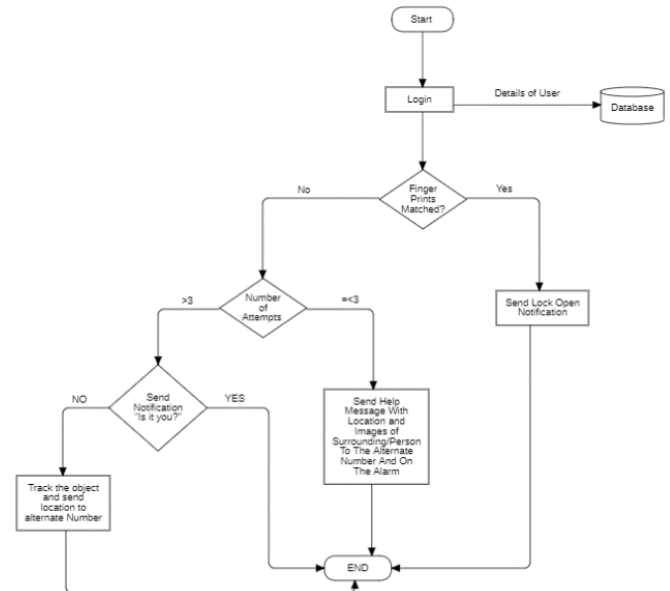


Fig 3 Flowchart of proposed system

Fingerprint sensor

An Optical fingerprint sensor:

Electro-optical fingerprint recognition is a biometric technology that provides for the scanning, differentiate, and recognition of fingerprints without the common need for ink and paper. An optical scanning and recognition system is used in combination with a matching system to enable systematic authentication for secure spaces and devices like other fingerprint scanning technologies, electro-optical fingerprint recognition makes it possible to fast and accurately compare a given fingerprint image to thousands of stored images.

Capacitive scanner:

A capacitive scanner is a fingerprint scanning device that uses an array of capacitive proximity sensors, also a microcomputer and related electronic signal processing circuits which will help to create and store a digital image of a person's fingerprint.

Rather than using technology of optical scanner where photographing an image of the ridges and valleys in a fingerprint a capacitive fingerprint scanner's sensors generate a complex pattern of electrical currents, which are processed to make a digital image of the fingerprint. Because the capacitive scanner needs the physical presence of the human finger in order to process the image, hence it is difficult to trick the capacitive scanner than the optical scanner.

Ultrasonic scanners

The newest fingerprint scanning technology to be used in the smartphone space is an ultrasonic sensor. Ultrasonic fingerprint scanner is predicated on what wont to be called Sense ID. Instead of existing scanners like photographic or capacitive fingerprint scanners, ultrasonic fingerprint scanners make use of very high-frequency ultrasonic sound. The user can't hear it, but these waves are used to map out the details of the user's fingerprint. Just like the capacitive scanner touch the top of the scanner.

Sensor used in our project:

Capacitive sensor will be used for biometric security bags over optical or ultrasonic scanners as it is compatible, compact in size, easily available and affordable, non-harmful The use of capacitive fingerprint sensor is to open the bag and get access of our belongings.

GPS

There are many satellites orbiting around the earth. Amongst these 30 satellites are dedicated for the Global Positioning System. Within these 30 GPS Satellites 24 satellites are operational and the remaining 6 are used as a backup.

The Global Positioning System or GPS is nothing but a radio-navigation system based on the satellites. It allows obtaining the information regarding the location of the user's position anywhere on the earth.

The GPS consists of the two main mathematical concepts, where the first concept is Trilateration and the second concept is based on the distance calculation.

Trilateration is a process used to find the position of a GPS device from three different distances. In order to track or locate the position of the GPS user accurately, this process uses the four GPS satellites revolving around the earth.

The GPS satellite broadcasts a signal which is received by the GPS receiver within a specific time and distance. The time and distance required by the signal to reach the GPS receiver is recorded by the satellite.

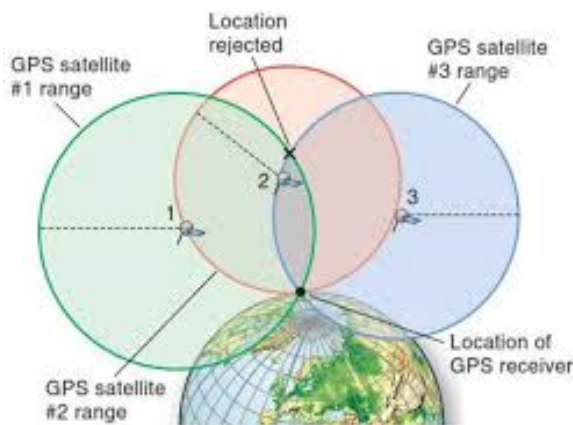


Fig.4 Trilateration with three satellites

In the above figure, the GPS satellite 1 will broadcast a signal which will be received by the GPS receiver and the satellite will record the time and the distance obtained by the signal to reach the receiver. Since the measure of the angle that is to be formed between the satellite and the receiver is unknown, a sphere will be formed around the satellite with the radius equal to the recorded distance and the GPS user's position will be anywhere inside this sphere.

The similar process is carried out by the GPS satellite 2 and 3 and the spheres are formed around each satellite respectively according to the recorded distance. The point of intersection of all the three spheres will give the actual position of the GPS user.



Fig.5 Trilateration with four satellites

Sometimes the position calculated by this method is partially accurate as there can be an error in the calculated distance between satellites and a GPS receiver. This error can possibly arise from the atomic clock which is incorporated into a GPS receiver, used to generate on-the-spot information regarding time. Hence, the fourth satellite comes into use here. The fourth satellite is used to reduce the error margin in order to obtain an accurate position. The distance calculated by the fourth satellite is used to compute the position related to the position data generated by the three satellites.

Distance calculation

For finding the position of the GPS user, following equation is considered.

$$\text{Distance travelled (m)} = \text{Speed (ms}^{-1}\text{)} \times \text{Time (s)}$$

The equation describes the relationship between the speed of the signal which is same as the speed of light ($c=299,792,458 \text{ ms}^{-1}$), the time taken by the signal to travel and the distance travelled.

In this paper, the GPS is used to track the location of the bag in case of a theft or in a situation of personal insecurity of the owner.

GSM

GSM module is used in the project to send messages to the alternate number provided by the user in case if wrong fingerprint is occurred.

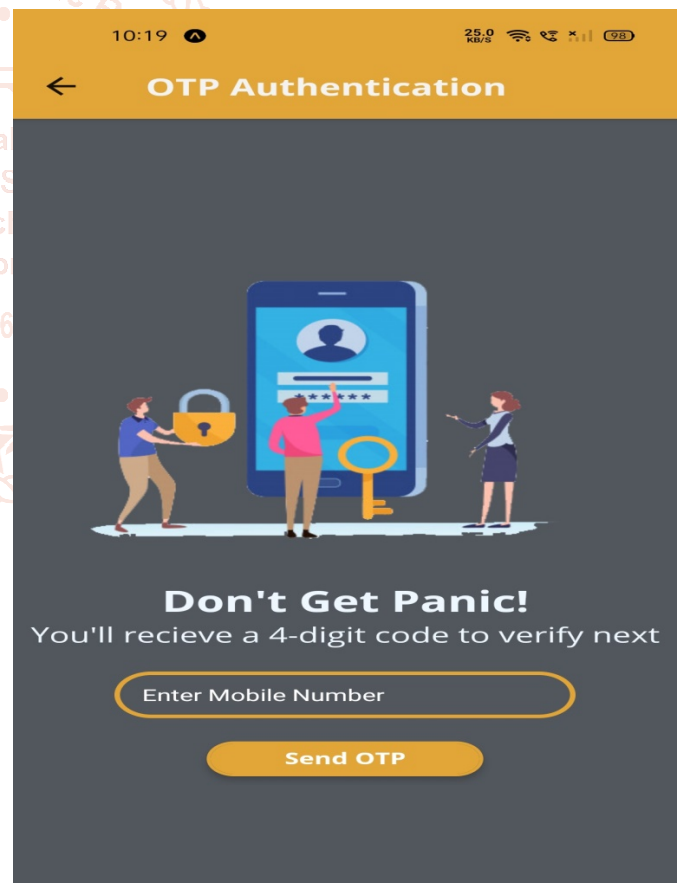
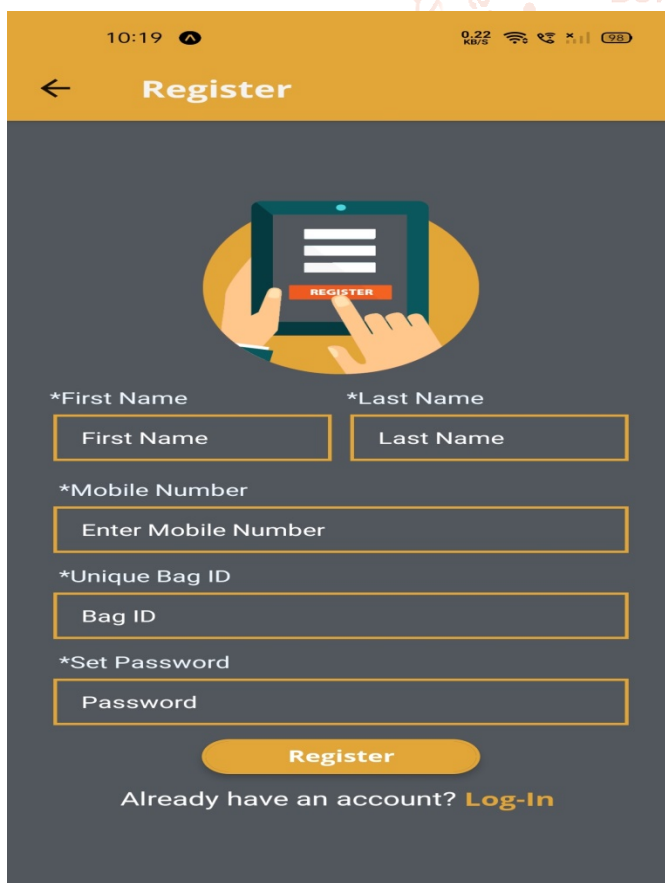
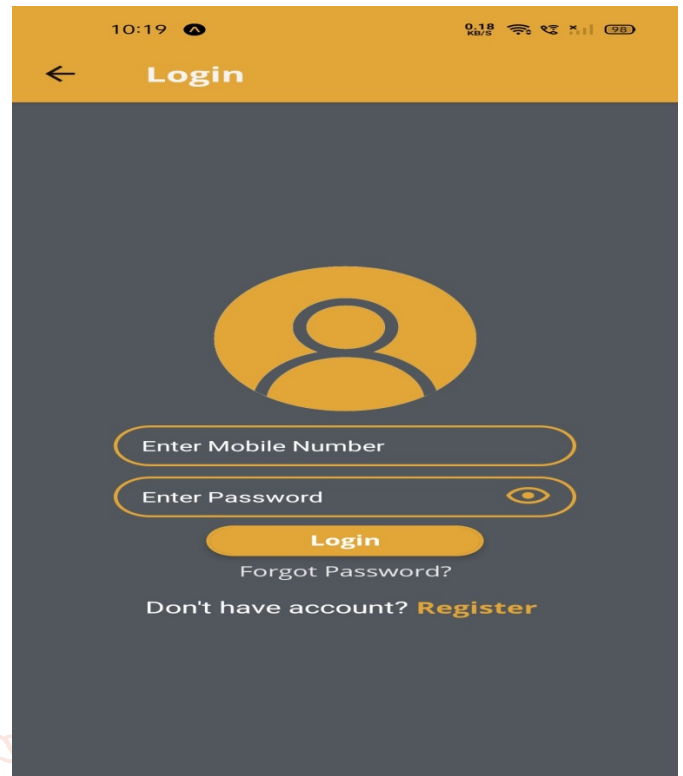
OpenCV

Face detection and identification in future going to play a vital role in everyone's day to day life. It is the technology which opens up many new possibilities and will cover almost every aspect of lives. This technology can cover security system, authentication system, smart home and many more which will be a great going to the automized world. A world fully automated to reduce human effort so that human can focus on other new discovery will be itself a great discovery. To detect face, we will use the Open CV. Open cv is a compilation of 2500+ library designed with the consideration to solve the computer vision problem such as image processing, capturing video, analysis including the feature such as face detection, object detection, openCV was launched in 2000.

V. APPLICATION OF THE PROPOSED SYSTEM

1. These bags are supposed to provide security to our belongings even in our absence and to keep them safe
2. With the help of these Biometric security bags we can create our surrounding little safer as with the help of camera we can keep watch on our surrounding can collect proper evidence against assailant which can help to reduce the time for the legal action against the assailant. These bags can also help us to keep watch on our loved ones and their surrounding so that we can protect them.
3. As the system alerts us on the stranger's access, we can sanitize our bag before accessing it which will help us avoiding the transmission of the disease such as corona virus.

OUTPUT



VI. Expected conclusion and Future scope

In future we will work on system and will try to design more compact, secure system with more affordable price.

ACKNOWLEDGMENT

We take this opportunity to thank our project guide Prof. Mangal Kotkar for their valuable guidance. We are also thankful of Head of the Department Prof. Rahul Ghode for providing all the necessary facilities, which were

indispensable in the completion of this project report. We are also thankful to all the staff members of the Department of Information Technology of Dhole Patil College of Engineering, Wagholi for their valuable time, support, comments, suggestions and persuasion. We would also like to thank the institute for providing the required facilities, Internet access and important books.

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